

The wake-up call

WWA's response to the 2013 Front Range floods



RISA Annual Meeting

University of Arizona, Tucson, AZ

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Western Water Assessment

CIRES, University of Colorado Boulder

Acknowledgements

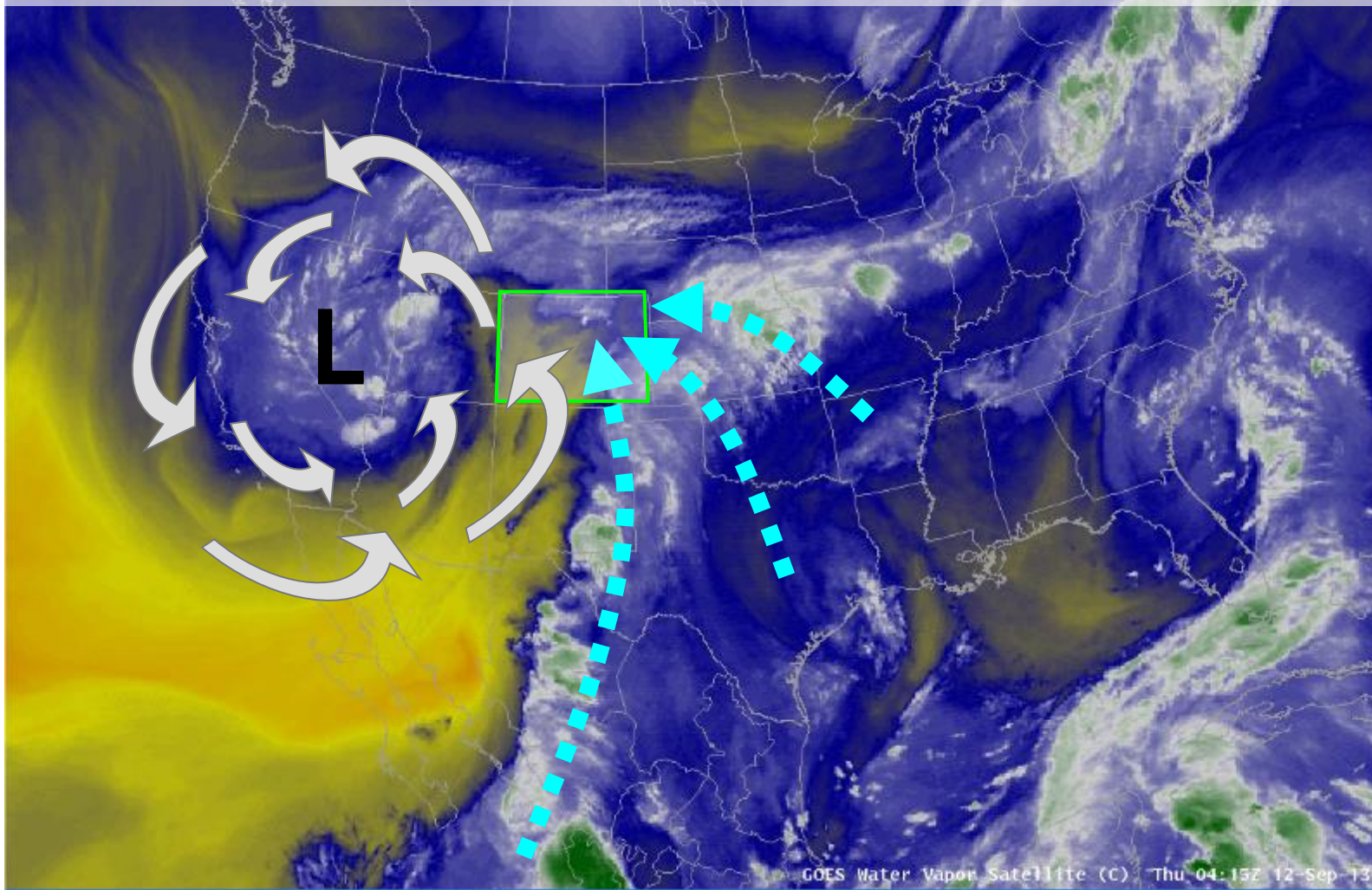
- Klaus Wolter, Kelly Mahoney, Joe Barsugli, Imtiaz Rangwala, Ben Livneh, Eric Gordon, Bill Travis, Adam McCurdy, Lisa Dilling, Bets McNie (CIRES/WWA)
- Nolan Doesken and Wendy Ryan (Colorado Climate Center, CSU)
- Martin Hoerling and George Kiladis (NOAA PSD)
- Matt Kelsch and Bob Henson (NCAR)
- Kevin Houck (CWCB)



The Event

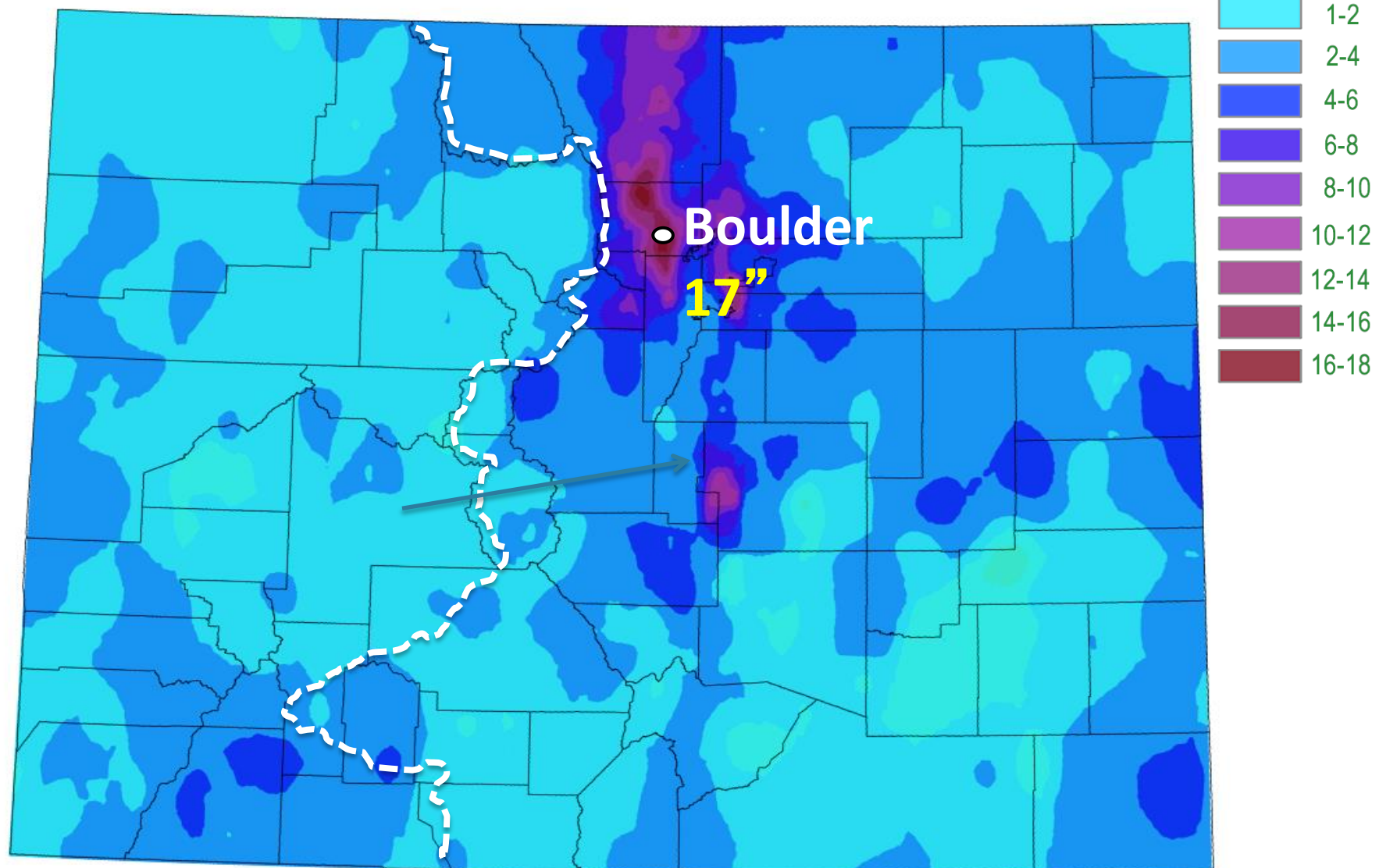
*Water vapor and atmospheric circulation at 11:15 pm MDT,
September 11, 2013.*

(Satellite image: CIMSS, University of Wisconsin)





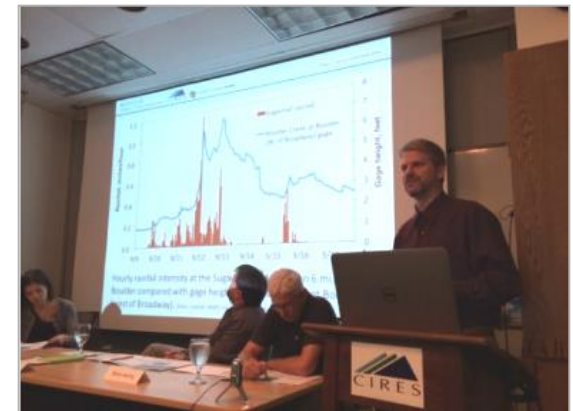
CoCoRAHS total precipitation from September 9–15, 2013





WWA's rapid response - 10 days

- 4-page preliminary assessment
- Released at briefing and panel discussion attended by ~100 on-site and ~200 online
- Media coverage by local papers, public radio, The Weather Channel, CS Monitor, USA Today



WWA's not-so-rapid outreach response

- 4-pager revised and reprinted in CSU's *Colorado Water* Dec. 2013 newsletter
- Presentations (2013-2014) to:
 - Colorado Association of Stormwater and Floodplain Managers
 - US Committee on Irrigation and Drainage
 - Ditch and Reservoir Company Alliance
 - Upper Colorado River Basin Annual Forum
 - City of Boulder Open Space & Mountain Parks staff
 - City of Boulder 1-year anniversary event (public)



Catalyst for engagement with new stakeholders

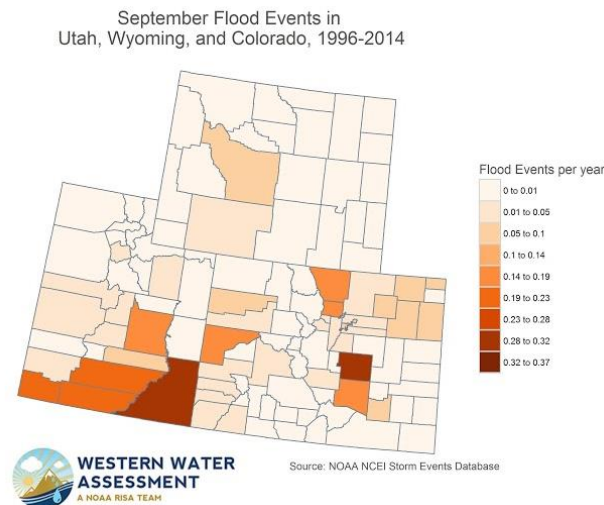
- Floodplain and stormwater planners and managers
- City, state, and federal emergency managers
- City, state, and federal hazard mitigation planners

Catalyst for research – specific to 2013 event

- High-resolution weather modeling of 2013 event and similar extreme precip events (K. Mahoney, 2013 - ongoing)
- Paper on climate-change attribution of the 2013 event (M. Hoerling et al. 2014, BAMS)
- Survey of local residents and public officials on “surprise” associated with 2013 event (L. Dilling et al., 2013-14)

Catalyst for research – broader scope

- Development of historical extreme events database for WWA region (CO, UT, WY) – 2013-ongoing
- Creation of new WWA research theme, “Extremes and Climate Risk Management” – 2014-ongoing
- Assessment of future projections of extreme precipitation events – 2015-ongoing



Parting thoughts

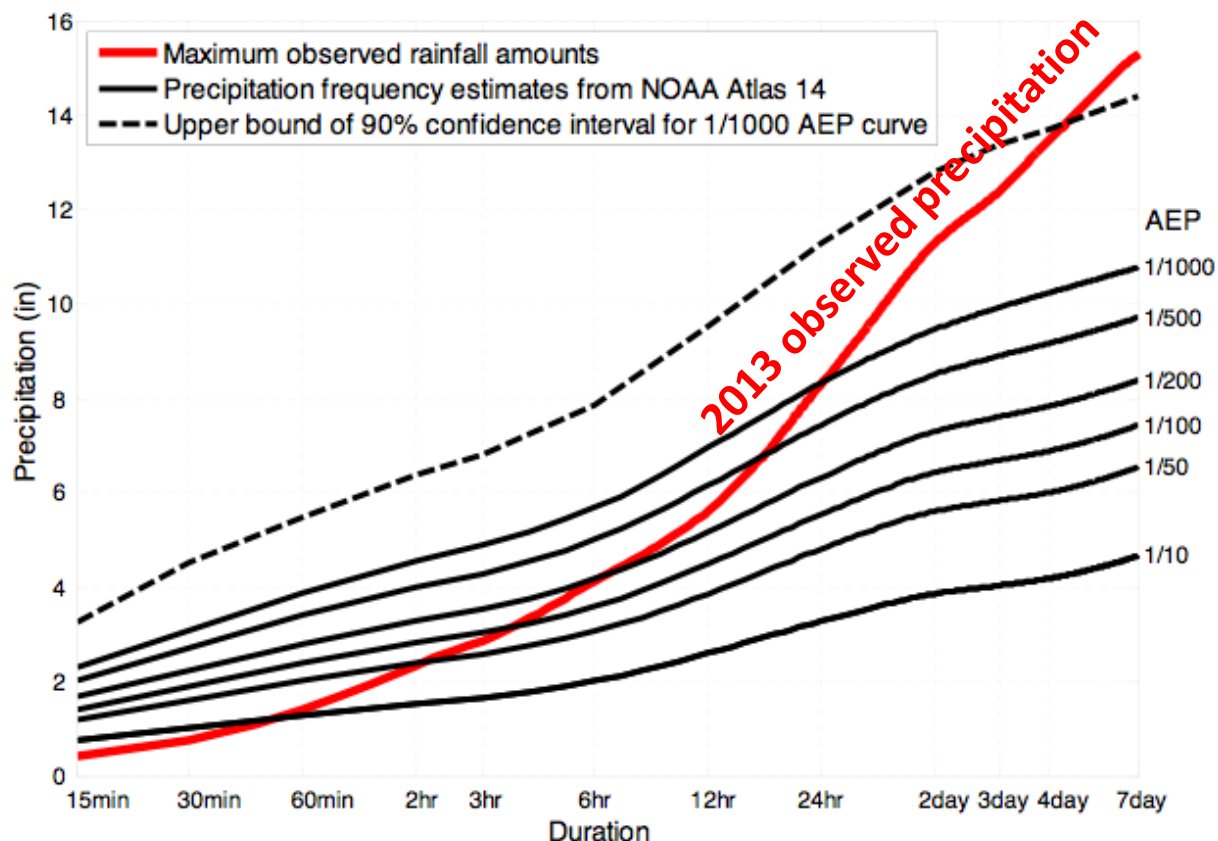
- Location strongly affected how we responded to this extreme event
- Climate-change attribution was not so important to our stakeholders
- We've spent more effort walking back the "1000-year event" meme



WWA's water focus now



Was it really a “1000-year rain” event? Unlikely.



◀ 1/1000

NOAA Atlas 14 - Observed rainfall (red) at **Boulder** for different periods compared to corresponding *precipitation frequency estimates* (black).